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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,725	04/27/2005	Christian Walsdorff	271089US0PCT	8748

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EXAMINER	
NGUYEN, NGOC YEN M	
ART UNIT	PAPER NUMBER
1754	

DATE MAILED: 10/04/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/532,725	WALSDORFF ET AL.	
	Examiner	Art Unit	
	Ngoc-Yen M. Nguyen	1754	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 March 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

The drawings are objected to because in Figure 1, the arrow for line 24a (which stems out from line 24 and go back to phase contact 6) appears to point to the wrong direction, the flow should be from line 24 to phase contact 6, not from 6 to 24 as shown. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it is unclear if substeps c1) and c2) are parts of the "distillation step". If they are, it is unclear how a hydrogen chloride stream IV is separated of from both streams I and II "in a distillation step", but only stream II is subjected to the substeps. If they are not, it is unclear if the substeps are carried out before or after the distillation step.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-2, 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson et al (2,542,961) in view of EP 1 099 666 and Itoh et al (4,774,070).

Johnson '961 discloses a process for producing chlorine by oxidizing hydrogen chloride.

As shown in the Figure and described in columns 3-7, anhydrous hydrochloride or an anhydrous hydrogen chloride containing gas is passed through line 10 into a reaction zone. The reaction zone may comprise a chamber type of reactor 12. Oxygen is introduced into the system by means of line 13 leading to line 10 passing into reactor

12. Within the reactor 12, the admixed hydrogen chloride and oxygen are reacted in the presence of a catalyst to produce chlorine (note column 3, lines 29-41). Reaction products are eliminated from the reaction chamber 12 through line 16. Effluence from reactor passing through line 16 will comprise besides chlorine and water, a substantial amount of unreacted hydrogen chloride and some entrained and volatized catalyst (note column 4, lines 46-55). After removing the entrained catalyst in chamber 20, a gaseous stream, comprising reaction products in admixture with chlorine, hydrogen chloride in water, is taken from chamber 20 passed through line 24, provided with cooler 25, into a hydrogen chloride absorbing zone. The hydrogen chloride absorbing zone may comprise a scrubber 26 (note paragraph bridging column 4-5). This scrubber 26 is considered the same as the phase contact apparatus 6 in Figures 1-2 of the instant specification and step e) as required in the instant claim 1.

Within column 26, substantially all the hydrogen chloride introduced by means of line 24 will be absorbed by the aqueous hydrogen chloride introduced through line 27, leaving a gaseous overhead consisting essentially of chlorine free of any substantial amount of hydrogen chloride. The gaseous overhead from column 26 consisting essentially of chlorine, a minor amount of water, and any inert gases introduced into, or formed within, the system, is passed through 29 to a suitable chlorine dehydrating zone. This dehydrating zone is considered the same as the optional step f) in the instant claim 1.

The liquid bottoms consisting essentially of aqueous hydrogen chloride enriched with the absorbed hydrogen chloride is passed from column 26 through line 40 into a

hydrogen stripping zone. The hydrogen chloride stripping zone may comprise a stripping column 44. Within the column 44, the enriched aqueous hydrogen chloride stream is subjected to stripping conditions forming a gaseous overhead consisting essentially of anhydrous hydrogen chloride and liquid bottoms consisting essentially of the hydrogen chloride water azeotrope (note column 5, line 62 to column 6, line 4). This stripping step is considered the same as the first substep c1), the liquid bottoms as "hydrochloric acid recycle stream II" and the gaseous overhead consisting essentially of anhydrous hydrogen chloride as the "hydrogen chloride stream IV".

The substantially anhydrous hydrogen chloride is recycled back to the reactor 12 (note column 6, lines 5-13) as required in step d) of the instant claim 1.

Liquid bottoms consisting essentially of aqueous hydrogen chloride containing hydrogen chloride (this fairly teaches that "aqueous hydrogen chloride" is a liquid or solution, not a gas) and water in the proportion of the azeotrope are taken from column 44. A portion of this azeotrope is used as the hydrogen chloride absorbing medium through line 27 for column 26 (note column 6, lines 14-26).

When charging aqueous hydrogen chloride to the system at least a part of such aqueous hydrogen chloride charge may be introduced into line 27 by means of valved line 28 (note column 6, lines 27-30). The "charging aqueous hydrogen chloride" as disclosed in Johnson '961 is considered the same as the "hydrochloric acid feed stream I" as required in the instant claim 1. It should be noted in Johnson, "aqueous hydrogen chloride" refers to a liquid or solution not to a gas.

The remainder azeotropic stream, which was not for column 26 is passed to suitable water removing means. The water removing means may comprise an extractive distillation column 55. Within the column 55, the aqueous hydrogen chloride stream is subjected to extractive distillation in the presence of an auxiliary solvent having a greater preference for water than hydrogen chloride (note column 6, lines 31-55).

The differences are Johnson does not disclose: 1), the second substep c2) to further recover HCl values from the azeotrope HCl solution and 2) the step of separating oxygen from the chlorine product and recycling the separated oxygen to the process.

For difference 1), EP '666 discloses a process separating hydrogen chloride and water from an aqueous hydrogen chloride (note title). As shown in Figure 3, hydrogen chloride 11 and oxygen 12 are fed to an oxidation reactor 3 of hydrogen chloride, an obtained reaction mixture is fed to an absorption column 4 of hydrogen chloride, and unreacted hydrogen chloride and product water in the reaction mixture are absorbed using a part of an aqueous hydrogen chloride solution 6 discharged from the bottom of the hydrogen chloride distillation column. Chlorine and oxygen 13 are recovered from the top of the absorption column 4 of hydrogen chloride. An aqueous hydrogen chloride solution 5 from the absorption column 4 is fed to the hydrogen chloride distillation column 1 with an aqueous hydrogen chloride solution 7 discharged from the bottom of the dehydration column 2. Hydrogen chloride 9 is recovered from the top of the hydrogen chloride distillation column 1, and fed to the oxidation reactor 3 of hydrogen chloride. A part of the aqueous hydrogen chloride solution 6 discharged from the

bottom of the hydrogen chloride distillation column 1 is fed to the dehydration column, water 10 is recovered from the top of the hydration column 2, and an aqueous hydrogen chloride solution 7 discharged from the bottom of the dehydration column 2 is recycled to the hydrogen chloride distillation column 1. A part 8 of the aqueous hydrogen chloride solution 6 discharged from the bottom of the hydrogen chloride distillation column 1 may be removed from the system (note paragraph [0026] and Figure 3). The pressure in the distillation column is higher than the pressure in the dehydration column (note abstract).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further recover HCl value from the azeotrope HCl stream in the process of Johnson '367 by using a distillation column and a dehydration column, as suggested by EP '166 because such process require no additional component, such as the auxiliary solvent as disclosed in Johnson '367.

For difference 2), Itoh '070 discloses a process for producing chlorine by oxidizing hydrogen chloride (note claim 1). Itoh '070 teaches that it is desirable in the art to separate the oxygen from the chlorine product and to recycle the separated oxygen (note steps 5 and 6 of claim 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further recover and recycle the oxygen in the process of Johnson '961 because such steps are desirable for an analogous process as taught in Itoh '070.

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson '961 in view of EP '666, Itoh '070 and Hagemeyer et al (6,197,275) optionally further in view of EP 0 618 170.

Johnson '961, EP '666 and Itoh '070 are applied as stated above.

The difference not yet is the integrated process for preparing isocyanates.

Hagemeyer '275 discloses a process for producing chlorine from hydrogen chloride (note claim 1). Hagemeyer '275 further discloses that in the phogenenation of diamines for the preparation of isocyanates for polyurethanes synthesis, HCl is obtained in large amounts as a byproduct. In view of a steadily increasing amount of HCl from production processes, there is a considerable demand for HCl recycling processes in which chlorine is recovered as the desired substance.

The steps i) to v) as required are conventional steps in a conventional process of producing isocyanate from phosgene and amines.

It would have been obvious to use the HCl by-product from a process of producing isocyanate as the starting reactant for the process of Johnson '961 because, as suggested by Hagemeyer '275, there is a demand for such HCl recycling process to produce chlorine.

Optionally EP '170 can be applied to teach the conventional steps of reacting phosgene with organic amine to form isocyanate. Most of the hydrogen chloride is a vapor which may be removed from the manufactured of the organic isocyanate at the overhead of the reaction chamber for collection, conversion to aqueous hydrochloric

acid and eventual sale. The entrained hydrogen chloride may be recovered further downstream by way of, for example, distillation (note page 2, lines 1-26).

Claims 1-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Johnson '961 in view of EP '666, Itoh '070 and Walsdorff et al (2004/0024244).

Johnson '961, EP '666 and Itoh '070 are applied as stated above.

The difference not yet is the integrated process for preparing isocyanates.

Walsdorff '244 discloses a process for preparing organic isocyanates, which comprises the steps:

(a) making available a first partial amount of chlorine, with the chlorine of this first partial amount having a content of free and bound bromine and iodine of < 400 ppm;

(b) making available a second partial amount of chlorine;

(c) reacting the first and second partial amounts of chlorine with carbon monoxide to form phosgene;

(d) reacting the phosgene from step (c) with one or more primary amines to form the corresponding isocyanates and hydrogen chloride;

(e) separating off and, if necessary, purifying the isocyanates formed in step (d);

(f) separating off and, if necessary, purifying the hydrogen chloride formed in step (d);

(g) catalytically oxidizing at least part of the hydrogen chloride separated off in step (e) by means of oxygen to form chlorine;

(h) separating off the chlorine formed in step (g) and using at least a partial amount of the chlorine which has been separated off as second partial amount of chlorine in step (b) (note claim 1).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to integrate the process of producing chlorine of Johnson '961 with a process of producing isocyanates, as suggested by Walsdorff '244 because the HCl by-product in the process of producing isocyanates can be used as the reactant for the process of producing chlorine and the chlorine product of the process of producing chlorine can be used for the process of producing isocyanates.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ngoc-Yen M. Nguyen whose telephone number is (571) 272-1356. The examiner is currently on Part time schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stanley Silverman can be reached on (571) 272-1358. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 or (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed (571) 272-1700.

Ngoc-Yen M. Nguyen
Primary Examiner
Art Unit 1754

nmn
October 1, 2006